

$$C_x^n = \frac{n!}{x!(n-x)!}$$

$$P_x^n = \frac{n!}{(n-x)!}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$P(B) = \sum_{i=1}^n P(A_i) \cdot P(B|A_i)$$

$$P(A_j|B) = \frac{P(A_j) \cdot P(B|A_j)}{P(B)}$$

$$E(X) = \mu = \sum_x xP(x)$$

$$\sigma^2 = \sum_x (x - \mu)^2 P(x) = \sum_x x^2 P(x) - \mu^2$$

$$\operatorname{Cov}(X,Y) = \sum_x \sum_y (x - \mu_X)(y - \mu_Y)P(x,y) = \sum_x \sum_y xyP(x,y) - \mu_X \mu_Y$$

$$\rho = r = \frac{\operatorname{Cov}(X,Y)}{S_X \cdot S_Y}$$

$$Z = aX + bY \implies$$

$$\begin{cases} E[Z] = aE[X] + bE[Y] \\ \operatorname{Var}(Z) = a^2 \operatorname{Var}(X) + b^2 \operatorname{Var}(Y) + 2ab \operatorname{Cov}(X,Y) \end{cases}$$

$$\overline{X} = \frac{\sum_{i=1}^n x_i}{N} = \frac{\sum_{i=1}^n x_i \cdot n_i}{N}$$

$$\overline{X}_g = \sqrt[n]{x_1 \cdot x_2 \cdot \cdot \cdot \cdot x_k}$$

$$Me = L_{i-1} + \frac{N/2 - N_{i-1}}{N_i - N_{i-1}} \cdot a_i$$

$$Mo = L_{i-1} + \frac{n_{i+1}}{n_{i+1} + n_{i-1}} \cdot a_i$$

$$Q_1 = L_{i-1} + \frac{N/4 - N_{i-1}}{N_i + N_{i-1}} \cdot a_i$$

$$Q_3 = L_{i-1} + \frac{3N/4 - N_{i-1}}{N_i + N_{i-1}} \cdot a_i$$

$$d_k = L_{i-1} + \frac{k \cdot N/10 - N_{i-1}}{N_i + N_{i-1}} \cdot a_i$$

$$p_k = L_{i-1} + \frac{k \cdot N/100 - N_{i-1}}{N_i + N_{i-1}} \cdot a_i$$

$$s^2 = \sum_{i=1}^n \frac{x_i^2 \cdot n_i}{N} - \overline{x}^2$$

$$= \frac{\sum_{i=1}^N (x_i - \overline{x})^2}{N}$$

$$C.V. = \frac{s_x}{\overline{x}} \cdot 100\%$$

$$n_{ij} = \frac{n_{i \cdot} \cdot n_{\cdot j}}{N}$$

$$g_1 = \frac{m_3}{s^3}$$

$$A_p = \frac{\overline{x} - Mo}{S}$$

$$g_2 = \frac{m_4}{s^4} - 3$$

$$As_B = \frac{(C_3 - C_2) - (C_2 - C_1)}{C_3 - C_1}$$

$$Cov(X,Y) = \frac{\sum_{i=1}^N (x_i - \overline{x})(y_i - \overline{y})}{N}$$

$$= \frac{\sum_{i,j} x_i \cdot y_j \cdot n_{ij}}{N} - \overline{x} \cdot \overline{y}$$

$$Y^* = a + bX$$

$$b = \frac{Cov(X,Y)}{s_X^2}$$

$$a = \overline{y} - b\overline{x}$$

$$\rho = r = \frac{Cov(X,Y)}{s_X \cdot s_Y}$$

$$R^2 = s_{Y*}^2 / s_Y^2$$

$$p_i = \frac{N_i}{N} = \frac{\sum_{r=1}^i n_r}{N} \cdot 100\% \quad q_i = \frac{U_i}{U_n} = \frac{\sum_{r=1}^i x_r \cdot n_r}{\sum_{r=1}^n x_r \cdot n_r} \cdot 100\%$$

$$I_G = \frac{\sum_{i=1}^{n-1} (p_i - q_i)}{\sum_{i=1}^{n-1} p_i}$$

$$I_{t/0} = \frac{X_t}{X_0}$$

$$S_{t/0}^P = \frac{\sum \frac{p_{ti}}{p_{0i}}}{N}$$

$$BD_{t/0}^P = \frac{\sum p_{ti}}{\sum p_{0i}}$$

$$L_{t/0}^P = \frac{\sum_{i=1}^k p_{it} \cdot q_{i0}}{\sum_{i=1}^k p_{i0} \cdot q_{i0}}$$

$$P_{t/0}^P = \frac{\sum_{i=1}^k p_{it} \cdot q_{it}}{\sum_{i=1}^k p_{i0} \cdot q_{it}}$$

$$F_{t/0} = \sqrt{L_{t/0} \cdot P_{t/0}}$$